

MULTIMEDIA



UNIVERSITY

STUDENT ID NO

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# MULTIMEDIA UNIVERSITY

## FINAL EXAMINATION

TRIMESTER 1, 2017/2018

**BFN2084 – PERSONAL FINANCE**

( All sections / Groups )

28 OCTOBER 2017

9.00 am – 11.00 am

(2 Hours )

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### INSTRUCTIONS TO STUDENTS

1. This question paper consists of **SEVEN (7)** pages excluding cover page.
2. **SECTION A: 20 Multiples Choice Questions.** Please shed your answer in the OMR sheet provided.

**SECTION B: 4 Structured Questions.** Answer **ALL FOUR** questions in the answer booklet provided.

3. Marks allocations are shown at the end of each question.

**SECTION A: MULTIPLE CHOICES QUESTIONS (40%)**

- 1) The individual designated by the owner of the life insurance policy to receive the policy's proceeds upon the death of the insured is called the
- A) policy holder.
  - B) beneficiary.
  - C) insured.
  - D) actuary.
  - E) heirs
- 2) Billy has chosen to purchase a new vehicle. The vehicle costs RM15,000. His APR is 10% and he will be financing the vehicle for 36 months. How much will Billy pay each month for his new vehicle?
- A) RM484.01
  - B) RM296.35
  - C) RM312.66
  - D) RM405.29
  - E) RM496.33
- 3) Sharing the financial consequences associated with risk in the insurance industry is sometimes called
- A) risk pooling.
  - B) risk deferring.
  - C) risk migration.
  - D) risk splitting.
  - E) none of the above
- 4) For which of these situations is life insurance a good idea?
- A) married with children
  - B) married, single-income couple with no children
  - C) single with no dependents
  - D) Only A and B
  - E) All of the above.
- 5) John purchases a life insurance policy on his wife Betty where he pays the premium and he will receive the life insurance money when she dies. John is both the \_\_\_\_\_ and the \_\_\_\_\_ who will receive the \_\_\_\_\_ upon the death of Betty, the \_\_\_\_\_.
- A) insured; beneficiary; money; policyholder
  - B) policy owner; beneficiary; face amount; insured
  - C) policy owner; insured; face amount; beneficiary
  - D) beneficiary; premium payer; face amount; policy holder
  - E) none of the above

**Continued...**

- 6) Which of the following is not a consideration in determining the amount of homeowner's insurance a person needs?
- A) Cover the entire replacement cost in the event of a complete loss.
  - B) Match the insurance coverage of similar homes in your neighborhood.
  - C) Protect against the effect of inflation eroding away your coverage.
  - D) Purchase flood or earthquake coverage if you are in an area prone to these occurrences.
  - E) Determine if detached structures are adequately covered under standard policies.
- 7) Antoine LaDuke suffered a major loss on his older home due to mud from a flood. Although he had homeowner's insurance, what was the probable reason he was not covered?
- A) His home was probably too expensive.
  - B) His policy excluded flood-related damages.
  - C) This is a personal liability issue.
  - D) Older homes are excluded from flood-related damages.
  - E) None of the above
- 8) An investor owns stock from seven different companies, two rental houses, and three government bonds. Together these assets are considered to be the investor's \_\_\_\_\_.
- A) collection
  - B) derivative holding
  - C) asset class
  - D) portfolio
  - E) none of the above
- 9) Suppose that you purchased a machine several years ago for your company. You recently sold the machine for more than you paid. This is an example of a \_\_\_\_\_.
- A) capital carry-forward
  - B) non-taxable gain
  - C) capital gain
  - D) windfall
  - E) none of the above
- 10) The \_\_\_\_\_ is the stated amount on the face of a bond, which the firm is to repay at the maturity date.
- A) historical value
  - B) debt price
  - C) par value
  - D) relevant value
  - E) none of the above

**Continued...**

- 11) When you purchase an asset that generates a return, it is generally considered to be \_\_\_\_\_.
- A) an investment
  - B) speculation
  - C) a windfall
  - D) an expected returner
  - E) none of the above
- 12) You have just purchased shares of stock from a stockbroker. These shares were previously traded on the Bursa Malaysia. This trade took place in the \_\_\_\_\_.
- A) primary market
  - B) secondary market
  - C) tertiary market
  - D) quaternary market
  - E) none of the above
- 13) A(n) \_\_\_\_\_ is a legal document that describes a securities issue and is made available to potential investors.
- A) disclosure statement
  - B) offering contract
  - C) prospectus
  - D) tombstone
  - E) none of the above
- 14) Which of the following is a disadvantage to mutual fund investing?
- A) On average they underperform the market returns.
  - B) Costs may be high and vary dramatically from fund to fund.
  - C) Not all mutual funds are truly safe.
  - D) You cannot diversify away systematic risk.
  - E) All of the above.
- 15) Which of the following is a benefit to investing in a mutual fund?
- A) Most small investors don't have the time, knowledge or desire to do the research necessary to purchase individual stocks.
  - B) Mutual fund transaction fees are considerably lower than the brokerage fees most small investors incur buying and selling individual stocks.
  - C) Most small investors want to be able to invest relatively small amounts of money on a regular basis.
  - D) All of the above are correct.
  - E) Only A and B are correct.

**Continued...**

- 16) As a child gets older, the main investment objective becomes \_\_\_\_ and consequently the percentage invested in common stocks should \_\_\_\_.
- A) Growth in capital; increase
  - B) Preservation of capital; increase
  - C) Growth in capital; decrease
  - D) Preservation of capital; decrease
  - E) None of the above
- 17) You are participating in a pension plan where the company's contributions vary from year to year, depending on the firm's performance. This is an example of a(n) \_\_\_\_.
- A) variable contribution plan
  - B) earnings establishment plan
  - C) performance retirement plan
  - D) profit-sharing plan
  - E) none of the above
- 18) When should you begin planning for a financially secure retirement?
- A) as soon as you begin your working career
  - B) in your early 40s
  - C) in your early 50s
  - D) in your early 60s
  - E) none of the above
- 19) Which of the following factors is the MOST important when determining your retirement savings needs?
- A) your desired retirement income
  - B) the expected rate of inflation
  - C) the rate of return you can earn on your savings
  - D) expected Social Security benefits
  - E) none of the above
- 20) You are engaging in \_\_\_\_ when you plan for what happens to your accumulated wealth and your dependents after you die, as well as determining decision-making authority should you be physically or mentally impaired.
- A) estate planning
  - B) retirement planning
  - C) unified planning
  - D) death establishment
  - E) None of the above is correct.

Continued...

**Section B: Structured Questions (60%).**

**Answer ALL the questions.**

**Question 1 (15 marks)**

- (a) How much did you borrow if your annual payments are RM5,000 for the next seven years and the interest rate is 9%?

(8 marks)

- (b) List the six keys to successful debt management.

(7 marks)

**Question 2 (15 marks)**

- (a) Describe the two basic approaches used to determine the amount of life insurance needed?

(7 marks)

- (b) Define coinsurance and deductible in a life insurance policy.

(8 marks)

**Question 3 (15 marks)**

- (a) What is the purpose for adjusting your asset allocation as you age? Discuss why wouldn't "the best" or highest returning portfolio always be prudent.

(6 marks)

- (b) Investors need to be aware of nine sources of risk when calculating the risk-return trade-off. List and briefly describe these nine sources of risk.

(9 marks)

**Question 4 (15 marks)**

- (a) Explain why timing is essential to retirement planning.

(5 marks)

- (b) Define estate planning. List the objectives to accomplish through estate planning.

(10 marks)

**The End of Page**

## Present Value and Future Value Tables

Table A-1 Future Value Interest Factors for One Dollar Compounded at  $k$  Percent for  $n$  Periods:  $FVIF_{k,n} = (1 + k)^n$ 

| Period | 1%     | 2%     | 3%     | 4%     | 5%     | 6%     | 7%     | 8%     | 9%     | 10%     | 11%     | 12%     | 13%     | 14%     | 15%     | 16%     | 20%     | 24%     | 25%     | 30%     |
|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 1      | 1.0100 | 1.0200 | 1.0300 | 1.0400 | 1.0500 | 1.0600 | 1.0700 | 1.0800 | 1.0900 | 1.1000  | 1.1100  | 1.1200  | 1.1300  | 1.1400  | 1.1500  | 1.1600  | 1.2000  | 1.2400  | 1.2500  | 1.3000  |
| 2      | 1.0201 | 1.0404 | 1.0609 | 1.0816 | 1.1025 | 1.1236 | 1.1449 | 1.1664 | 1.1881 | 1.2100  | 1.2321  | 1.2544  | 1.2769  | 1.2996  | 1.3225  | 1.3456  | 1.4400  | 1.5376  | 1.5625  | 1.6900  |
| 3      | 1.0303 | 1.0612 | 1.0927 | 1.1249 | 1.1576 | 1.1910 | 1.2250 | 1.2597 | 1.2950 | 1.3310  | 1.3676  | 1.4049  | 1.4429  | 1.4815  | 1.5209  | 1.5609  | 1.7280  | 1.9066  | 1.9531  | 2.1970  |
| 4      | 1.0406 | 1.0824 | 1.1255 | 1.1699 | 1.2155 | 1.2625 | 1.3108 | 1.3605 | 1.4116 | 1.4641  | 1.5181  | 1.5735  | 1.6305  | 1.6890  | 1.7490  | 1.8106  | 2.0736  | 2.3642  | 2.4414  | 2.8561  |
| 5      | 1.0510 | 1.1041 | 1.1593 | 1.2167 | 1.2763 | 1.3382 | 1.4026 | 1.4693 | 1.5386 | 1.6105  | 1.6851  | 1.7623  | 1.8424  | 1.9254  | 2.0114  | 2.1003  | 2.4883  | 2.9316  | 3.0518  | 3.7129  |
| 6      | 1.0615 | 1.1262 | 1.1941 | 1.2653 | 1.3401 | 1.4185 | 1.5007 | 1.5869 | 1.6771 | 1.7716  | 1.8704  | 1.9738  | 2.0820  | 2.1950  | 2.3131  | 2.4364  | 2.9860  | 3.6352  | 3.8147  | 4.8268  |
| 7      | 1.0721 | 1.1487 | 1.2299 | 1.3159 | 1.4071 | 1.5036 | 1.6058 | 1.7138 | 1.8280 | 1.9487  | 2.0762  | 2.2107  | 2.3526  | 2.5023  | 2.6600  | 2.8262  | 3.5832  | 4.5077  | 4.7684  | 6.2749  |
| 8      | 1.0829 | 1.1717 | 1.2668 | 1.3686 | 1.4775 | 1.5938 | 1.7182 | 1.8509 | 1.9926 | 2.1436  | 2.3045  | 2.4760  | 2.6584  | 2.8526  | 3.0590  | 3.2784  | 4.2998  | 5.5895  | 5.9605  | 8.1573  |
| 9      | 1.0937 | 1.1951 | 1.3048 | 1.4233 | 1.5513 | 1.6895 | 1.8385 | 1.9990 | 2.1719 | 2.3579  | 2.5580  | 2.7731  | 3.0040  | 3.2519  | 3.5179  | 3.8030  | 5.1598  | 6.9310  | 7.4506  | 10.504  |
| 10     | 1.1046 | 1.2190 | 1.3439 | 1.4802 | 1.6289 | 1.7908 | 1.9672 | 2.1589 | 2.3674 | 2.5937  | 2.8394  | 3.1058  | 3.3946  | 3.7072  | 4.0456  | 4.4114  | 6.1917  | 8.5944  | 9.3132  | 13.786  |
| 11     | 1.1157 | 1.2434 | 1.3842 | 1.5395 | 1.7103 | 1.8983 | 2.1049 | 2.3316 | 2.5804 | 2.8531  | 3.1518  | 3.4785  | 3.8359  | 4.2262  | 4.6524  | 5.1173  | 7.4301  | 10.657  | 11.642  | 17.922  |
| 12     | 1.1268 | 1.2682 | 1.4258 | 1.6010 | 1.7959 | 2.0122 | 2.2522 | 2.5182 | 2.8127 | 3.1384  | 3.4985  | 3.8960  | 4.3345  | 4.8179  | 5.3503  | 5.9360  | 8.9161  | 13.215  | 14.552  | 23.298  |
| 13     | 1.1381 | 1.2936 | 1.4685 | 1.6651 | 1.8856 | 2.1329 | 2.4098 | 2.7196 | 3.0688 | 3.4523  | 3.8833  | 4.3635  | 4.8980  | 5.4924  | 6.1528  | 6.8858  | 10.699  | 16.386  | 18.190  | 30.288  |
| 14     | 1.1495 | 1.3195 | 1.5126 | 1.7317 | 1.9799 | 2.2609 | 2.5785 | 2.9372 | 3.3417 | 3.7975  | 4.3104  | 4.8871  | 5.5348  | 6.2613  | 7.0757  | 7.9875  | 12.839  | 20.319  | 22.737  | 39.374  |
| 15     | 1.1610 | 1.3459 | 1.5580 | 1.8009 | 2.0789 | 2.3966 | 2.7590 | 3.1722 | 3.6425 | 4.1772  | 4.7846  | 5.4736  | 6.2543  | 7.1379  | 8.1371  | 9.2655  | 15.407  | 25.196  | 28.422  | 51.186  |
| 16     | 1.1726 | 1.3728 | 1.6047 | 1.8730 | 2.1829 | 2.5404 | 2.9522 | 3.4259 | 3.9703 | 4.5980  | 5.3109  | 6.1304  | 7.0673  | 8.1372  | 9.3576  | 10.748  | 18.488  | 31.243  | 35.527  | 66.542  |
| 17     | 1.1843 | 1.4002 | 1.6528 | 1.9479 | 2.2920 | 2.6928 | 3.1588 | 3.7000 | 4.3276 | 5.0545  | 5.8951  | 6.8660  | 7.9861  | 9.2765  | 10.761  | 12.468  | 22.186  | 38.741  | 44.409  | 86.504  |
| 18     | 1.1961 | 1.4282 | 1.7024 | 2.0258 | 2.4066 | 2.8543 | 3.3799 | 3.9960 | 4.7171 | 5.5599  | 6.5436  | 7.6900  | 9.0243  | 10.575  | 12.375  | 14.463  | 26.623  | 48.039  | 55.511  | 112.455 |
| 19     | 1.2081 | 1.4568 | 1.7535 | 2.1068 | 2.5270 | 3.0256 | 3.6165 | 4.3157 | 5.1417 | 6.1159  | 7.2633  | 8.6128  | 10.197  | 12.056  | 14.232  | 16.777  | 31.948  | 59.568  | 69.389  | 146.192 |
| 20     | 1.2202 | 1.4859 | 1.8061 | 2.1911 | 2.6533 | 3.2071 | 3.8697 | 4.6610 | 5.6044 | 6.7275  | 8.0623  | 9.6463  | 11.523  | 13.743  | 16.367  | 19.461  | 38.338  | 73.864  | 86.736  | 190.050 |
| 21     | 1.2324 | 1.5157 | 1.8603 | 2.2788 | 2.7860 | 3.3996 | 4.1406 | 5.0338 | 6.1088 | 7.4002  | 8.9492  | 10.804  | 13.021  | 15.668  | 18.822  | 22.574  | 46.005  | 91.592  | 108.420 | 247.065 |
| 22     | 1.2447 | 1.5460 | 1.9161 | 2.3699 | 2.9253 | 3.6035 | 4.4304 | 5.4365 | 6.6586 | 8.1403  | 9.9336  | 12.100  | 14.714  | 17.861  | 21.645  | 26.186  | 55.206  | 113.574 | 135.535 | 321.184 |
| 23     | 1.2572 | 1.5769 | 1.9736 | 2.4647 | 3.0715 | 3.8197 | 4.7405 | 5.8715 | 7.2579 | 8.9543  | 11.026  | 13.552  | 16.627  | 20.362  | 24.891  | 30.376  | 66.247  | 140.831 | 169.407 | 417.539 |
| 24     | 1.2697 | 1.6084 | 2.0328 | 2.5633 | 3.2251 | 4.0489 | 5.0724 | 6.3412 | 7.9111 | 9.8497  | 12.239  | 15.179  | 18.788  | 23.212  | 28.625  | 35.236  | 79.497  | 174.631 | 211.758 | 542.801 |
| 25     | 1.2824 | 1.6406 | 2.0936 | 2.6658 | 3.3864 | 4.2919 | 5.4274 | 6.8485 | 8.6231 | 10.835  | 13.585  | 17.000  | 21.231  | 26.462  | 32.919  | 40.874  | 95.396  | 216.542 | 264.698 | 705.641 |
| 30     | 1.3478 | 1.8114 | 2.4273 | 3.2434 | 4.3219 | 5.7435 | 7.6123 | 10.063 | 13.268 | 17.449  | 22.892  | 29.960  | 39.116  | 50.950  | 66.212  | 85.850  | 237.376 | 634.820 | 807.794 | *       |
| 35     | 1.4166 | 1.9999 | 2.8139 | 3.9461 | 5.5160 | 7.6861 | 10.677 | 14.785 | 20.414 | 28.102  | 38.575  | 52.800  | 72.069  | 98.100  | 133.176 | 180.314 | 590.668 | *       | *       | *       |
| 40     | 1.4889 | 2.2080 | 3.2620 | 4.8010 | 7.0400 | 10.286 | 14.974 | 21.725 | 31.409 | 45.259  | 65.001  | 93.051  | 132.782 | 188.884 | 267.864 | 378.721 | *       | *       | *       | *       |
| 50     | 1.6446 | 2.6916 | 4.3839 | 7.1067 | 11.467 | 18.420 | 29.457 | 46.902 | 74.358 | 117.391 | 184.565 | 289.002 | 450.736 | 700.233 | *       | *       | *       | *       | *       | *       |

Table A-2 Future Value Interest Factors for a One-Dollar Annuity Compounded at  $k$  Percent for  $n$  Periods:  $FVIFA_{k,n} = [(1 + k)^n - 1] / k$ 

| Period | 1%     | 2%     | 3%      | 4%      | 5%      | 6%      | 7%      | 8%      | 9%      | 10%     | 11%     | 12%     | 13%     | 14%     | 15%     | 16%     | 20%     | 24%     | 25%     | 30%     |
|--------|--------|--------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 1      | 1.0000 | 1.0200 | 1.0300  | 1.0400  | 1.0500  | 1.0600  | 1.0700  | 1.0800  | 1.0900  | 1.1000  | 1.1100  | 1.1200  | 1.1300  | 1.1400  | 1.1500  | 1.1600  | 1.2000  | 1.2400  | 1.2500  | 1.3000  |
| 2      | 2.0100 | 2.0200 | 2.0300  | 2.0400  | 2.0500  | 2.0600  | 2.0700  | 2.0800  | 2.0900  | 2.1000  | 2.1100  | 2.1200  | 2.1300  | 2.1400  | 2.1500  | 2.1600  | 2.2000  | 2.2400  | 2.2500  | 2.3000  |
| 3      | 3.0301 | 3.0604 | 3.0909  | 3.1216  | 3.1525  | 3.1836  | 3.2149  | 3.2464  | 3.2781  | 3.3100  | 3.3421  | 3.3744  | 3.4069  | 3.4396  | 3.4725  | 3.5056  | 3.6400  | 3.7776  | 3.8125  | 3.9900  |
| 4      | 4.0604 | 4.1216 | 4.1836  | 4.2465  | 4.3101  | 4.3746  | 4.4399  | 4.5061  | 4.5731  | 4.6410  | 4.7097  | 4.7793  | 4.8498  | 4.9211  | 4.9934  | 5.0665  | 5.3680  | 5.6842  | 5.7656  | 6.1870  |
| 5      | 5.1010 | 5.2040 | 5.3091  | 5.4163  | 5.5256  | 5.6371  | 5.7507  | 5.8666  | 5.9847  | 6.1051  | 6.2278  | 6.3528  | 6.4803  | 6.6101  | 6.7424  | 6.8771  | 7.4416  | 8.0484  | 8.2070  | 9.0431  |
| 6      | 6.1520 | 6.3081 | 6.4684  | 6.6330  | 6.8019  | 6.9753  | 7.1533  | 7.3359  | 7.5233  | 7.7156  | 7.9129  | 8.1152  | 8.3227  | 8.5355  | 8.7537  | 8.9775  | 9.9299  | 10.980  | 11.259  | 12.756  |
| 7      | 7.2135 | 7.4343 | 7.6625  | 7.8983  | 8.1420  | 8.3938  | 8.6540  | 8.9228  | 9.2004  | 9.4872  | 9.7833  | 10.089  | 10.405  | 10.730  | 11.067  | 11.414  | 12.916  | 14.615  | 15.073  | 17.583  |
| 8      | 8.2857 | 8.5830 | 8.8923  | 9.2142  | 9.5491  | 9.8975  | 10.260  | 10.637  | 11.028  | 11.436  | 11.859  | 12.300  | 12.757  | 13.233  | 13.727  | 14.240  | 16.499  | 19.123  | 19.842  | 23.858  |
| 9      | 9.3685 | 9.7546 | 10.159  | 10.583  | 11.027  | 11.491  | 11.978  | 12.488  | 13.021  | 13.579  | 14.164  | 14.776  | 15.416  | 16.085  | 16.786  | 17.519  | 20.799  | 24.712  | 25.802  | 32.015  |
| 10     | 10.462 | 10.950 | 11.464  | 12.006  | 12.578  | 13.181  | 13.816  | 14.487  | 15.193  | 15.937  | 16.722  | 17.549  | 18.420  | 19.337  | 20.304  | 21.321  | 25.959  | 31.643  | 33.253  | 42.619  |
| 11     | 11.567 | 12.169 | 12.808  | 13.486  | 14.207  | 14.972  | 15.784  | 16.645  | 17.560  | 18.531  | 19.561  | 20.655  | 21.814  | 23.045  | 24.349  | 25.733  | 32.150  | 40.238  | 42.566  | 56.405  |
| 12     | 12.683 | 13.412 | 14.192  | 15.026  | 15.917  | 16.870  | 17.888  | 18.977  | 20.141  | 21.384  | 22.713  | 24.133  | 25.650  | 27.271  | 29.002  | 30.850  | 39.581  | 50.895  | 54.208  | 74.327  |
| 13     | 13.809 | 14.680 | 15.618  | 16.627  | 17.713  | 18.882  | 20.141  | 21.495  | 22.953  | 24.523  | 26.212  | 28.029  | 29.985  | 32.089  | 34.352  | 36.786  | 48.497  | 64.110  | 68.760  | 97.625  |
| 14     | 14.947 | 15.974 | 17.066  | 18.292  | 19.599  | 21.015  | 22.550  | 24.215  | 26.019  | 27.975  | 30.095  | 32.393  | 34.883  | 37.581  | 40.505  | 43.672  | 59.196  | 80.496  | 86.949  | 127.913 |
| 15     | 16.097 | 17.293 | 18.599  | 20.024  | 21.579  | 23.276  | 25.129  | 27.152  | 29.361  | 31.772  | 34.405  | 37.280  | 40.417  | 43.842  | 47.580  | 51.660  | 72.035  | 100.815 | 109.687 | 167.286 |
| 16     | 17.258 | 18.639 | 20.157  | 21.825  | 23.657  | 25.673  | 27.888  | 30.324  | 33.003  | 35.950  | 39.190  | 42.753  | 46.672  | 50.980  | 55.717  | 60.925  | 87.442  | 126.011 | 138.109 | 218.472 |
| 17     | 18.430 | 20.012 | 21.762  | 23.698  | 25.840  | 28.213  | 30.840  | 33.750  | 36.974  | 40.545  | 44.501  | 48.884  | 53.739  | 59.118  | 65.075  | 71.673  | 105.931 | 157.253 | 173.636 | 285.014 |
| 18     | 19.615 | 21.412 | 23.414  | 25.645  | 28.132  | 30.906  | 33.999  | 37.450  | 41.301  | 45.599  | 50.396  | 55.750  | 61.725  | 68.394  | 75.836  | 84.141  | 128.117 | 195.994 | 218.045 | 371.518 |
| 19     | 20.811 | 22.841 | 25.117  | 27.671  | 30.539  | 33.760  | 37.379  | 41.446  | 46.018  | 51.159  | 56.939  | 63.440  | 70.749  | 78.969  | 88.212  | 98.603  | 154.740 | 244.033 | 273.556 | 483.973 |
| 20     | 22.019 | 24.297 | 26.870  | 29.778  | 33.066  | 36.786  | 40.995  | 45.762  | 51.160  | 57.275  | 64.203  | 72.052  | 80.947  | 91.025  | 102.444 | 115.380 | 186.688 | 303.601 | 342.945 | 630.165 |
| 21     | 23.239 | 25.783 | 28.676  | 31.969  | 35.719  | 39.933  | 44.865  | 50.423  | 56.765  | 64.002  | 72.265  | 81.699  | 92.470  | 104.768 | 118.810 | 134.841 | 225.026 | 377.465 | 429.681 | 820.215 |
| 22     | 24.472 | 27.299 | 30.537  | 34.248  | 38.505  | 43.392  | 49.006  | 55.457  | 62.873  | 71.403  | 81.214  | 92.503  | 105.491 | 120.436 | 137.632 | 157.415 | 271.031 | 469.056 | 538.101 | *       |
| 23     | 25.716 | 28.845 | 32.453  | 36.618  | 41.430  | 46.996  | 53.436  | 60.893  | 69.532  | 79.543  | 91.148  | 104.603 | 120.205 | 138.297 | 159.276 | 183.601 | 326.237 | 582.630 | 673.626 | *       |
| 24     | 26.973 | 30.422 | 34.426  | 39.083  | 44.502  | 50.816  | 58.177  | 66.765  | 76.790  | 88.497  | 102.174 | 118.155 | 136.831 | 158.659 | 184.168 | 213.978 | 392.484 | 723.461 | 843.033 | *       |
| 25     | 28.243 | 32.030 | 36.459  | 41.646  | 47.727  | 54.865  | 63.249  | 73.106  | 84.701  | 98.347  | 114.413 | 133.334 | 155.620 | 181.871 | 212.793 | 249.214 | 471.981 | 898.092 | *       | *       |
| 30     | 34.785 | 40.568 | 47.575  | 56.085  | 66.439  | 79.058  | 94.461  | 113.283 | 136.308 | 164.494 | 199.021 | 241.333 | 293.199 | 356.787 | 434.745 | 530.312 | *       | *       | *       | *       |
| 35     | 41.660 | 49.994 | 60.462  | 73.652  | 90.320  | 111.435 | 138.237 | 172.317 | 215.711 | 271.024 | 341.590 | 431.663 | 546.681 | 693.573 | 881.170 | *       | *       | *       | *       | *       |
| 36     | 43.077 | 51.994 | 63.276  | 77.598  | 95.836  | 119.121 | 148.913 | 187.102 | 236.125 | 299.127 | 380.164 | 484.463 | 618.749 | 791.673 | *       | *       | *       | *       | *       | *       |
| 40     | 48.886 | 60.402 | 75.401  | 95.026  | 120.800 | 154.762 | 199.635 | 259.057 | 337.882 | 442.593 | 581.826 | 767.091 | *       | *       | *       | *       | *       | *       | *       | *       |
| 50     | 64.463 | 84.579 | 112.797 | 152.667 | 209.348 | 290.336 | 406.529 | 573.770 | 815.084 | *       | *       | *       | *       | *       | *       | *       | *       | *       | *       | *       |

## Present Value and Future Value Tables

Table A-3 Present Value Interest Factors for One Dollar Discounted at  $k$  Percent for  $n$  Periods:  $PVIF_{k,n} = 1 / (1 + k)^n$ 

| Period | 1%     | 2%     | 3%     | 4%     | 5%     | 6%     | 7%     | 8%     | 9%     | 10%    | 11%    | 12%    | 13%    | 14%    | 15%    | 16%    | 20%    | 24%    | 25%    | 30%    |
|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 1      | 0.9901 | 0.9804 | 0.9709 | 0.9615 | 0.9524 | 0.9434 | 0.9346 | 0.9259 | 0.9174 | 0.9091 | 0.9009 | 0.8929 | 0.8850 | 0.8772 | 0.8696 | 0.8621 | 0.8333 | 0.8065 | 0.8000 | 0.7692 |
| 2      | 0.9803 | 0.9612 | 0.9426 | 0.9246 | 0.9070 | 0.8900 | 0.8734 | 0.8573 | 0.8417 | 0.8264 | 0.8116 | 0.7972 | 0.7831 | 0.7695 | 0.7561 | 0.7432 | 0.6944 | 0.6504 | 0.6400 | 0.5917 |
| 3      | 0.9706 | 0.9423 | 0.9151 | 0.8890 | 0.8638 | 0.8396 | 0.8163 | 0.7938 | 0.7722 | 0.7513 | 0.7312 | 0.7118 | 0.6931 | 0.6750 | 0.6575 | 0.6407 | 0.5787 | 0.5245 | 0.5120 | 0.4552 |
| 4      | 0.9610 | 0.9238 | 0.8885 | 0.8548 | 0.8227 | 0.7921 | 0.7629 | 0.7350 | 0.7084 | 0.6830 | 0.6587 | 0.6355 | 0.6133 | 0.5921 | 0.5718 | 0.5523 | 0.4823 | 0.4230 | 0.4096 | 0.3501 |
| 5      | 0.9515 | 0.9057 | 0.8626 | 0.8219 | 0.7835 | 0.7473 | 0.7130 | 0.6806 | 0.6499 | 0.6209 | 0.5935 | 0.5674 | 0.5428 | 0.5194 | 0.4972 | 0.4761 | 0.4019 | 0.3411 | 0.3277 | 0.2693 |
| 6      | 0.9420 | 0.8880 | 0.8375 | 0.7903 | 0.7462 | 0.7050 | 0.6663 | 0.6302 | 0.5963 | 0.5645 | 0.5346 | 0.5066 | 0.4803 | 0.4556 | 0.4323 | 0.4104 | 0.3349 | 0.2751 | 0.2621 | 0.2072 |
| 7      | 0.9327 | 0.8706 | 0.8131 | 0.7599 | 0.7107 | 0.6651 | 0.6227 | 0.5835 | 0.5470 | 0.5132 | 0.4817 | 0.4523 | 0.4251 | 0.3996 | 0.3759 | 0.3538 | 0.2791 | 0.2218 | 0.2097 | 0.1594 |
| 8      | 0.9235 | 0.8535 | 0.7894 | 0.7307 | 0.6768 | 0.6274 | 0.5820 | 0.5403 | 0.5019 | 0.4665 | 0.4339 | 0.3762 | 0.3506 | 0.3269 | 0.3050 | 0.2843 | 0.2326 | 0.1789 | 0.1678 | 0.1226 |
| 9      | 0.9143 | 0.8368 | 0.7664 | 0.7026 | 0.6446 | 0.5919 | 0.5439 | 0.5002 | 0.4604 | 0.4241 | 0.3909 | 0.3606 | 0.3329 | 0.3075 | 0.2843 | 0.2630 | 0.1938 | 0.1443 | 0.1342 | 0.0943 |
| 10     | 0.9053 | 0.8203 | 0.7441 | 0.6756 | 0.6139 | 0.5584 | 0.5083 | 0.4632 | 0.4224 | 0.3855 | 0.3522 | 0.3220 | 0.2946 | 0.2697 | 0.2472 | 0.2267 | 0.1615 | 0.1164 | 0.1074 | 0.0725 |
| 11     | 0.8963 | 0.8043 | 0.7224 | 0.6496 | 0.5847 | 0.5288 | 0.4751 | 0.4289 | 0.3875 | 0.3505 | 0.3173 | 0.2875 | 0.2607 | 0.2366 | 0.2149 | 0.1954 | 0.1346 | 0.0938 | 0.0859 | 0.0558 |
| 12     | 0.8874 | 0.7885 | 0.7014 | 0.6246 | 0.5568 | 0.4970 | 0.4440 | 0.3971 | 0.3555 | 0.3186 | 0.2858 | 0.2567 | 0.2307 | 0.2076 | 0.1869 | 0.1685 | 0.1122 | 0.0757 | 0.0687 | 0.0429 |
| 13     | 0.8787 | 0.7730 | 0.6810 | 0.6006 | 0.5303 | 0.4688 | 0.4150 | 0.3677 | 0.3262 | 0.2897 | 0.2575 | 0.2292 | 0.2042 | 0.1821 | 0.1625 | 0.1452 | 0.0935 | 0.0610 | 0.0550 | 0.0330 |
| 14     | 0.8700 | 0.7579 | 0.6611 | 0.5775 | 0.5051 | 0.4423 | 0.3878 | 0.3405 | 0.2992 | 0.2633 | 0.2320 | 0.2046 | 0.1807 | 0.1597 | 0.1413 | 0.1252 | 0.0779 | 0.0492 | 0.0440 | 0.0254 |
| 15     | 0.8613 | 0.7430 | 0.6419 | 0.5553 | 0.4810 | 0.4173 | 0.3624 | 0.3152 | 0.2745 | 0.2394 | 0.2090 | 0.1821 | 0.1581 | 0.1377 | 0.1229 | 0.1079 | 0.0649 | 0.0397 | 0.0352 | 0.0195 |
| 16     | 0.8528 | 0.7284 | 0.6232 | 0.5339 | 0.4581 | 0.3936 | 0.3387 | 0.2919 | 0.2519 | 0.2176 | 0.1883 | 0.1631 | 0.1415 | 0.1229 | 0.1069 | 0.0930 | 0.0541 | 0.0320 | 0.0281 | 0.0150 |
| 17     | 0.8444 | 0.7142 | 0.6050 | 0.5134 | 0.4363 | 0.3714 | 0.3166 | 0.2703 | 0.2311 | 0.1978 | 0.1696 | 0.1456 | 0.1252 | 0.1078 | 0.0929 | 0.0802 | 0.0451 | 0.0258 | 0.0225 | 0.0116 |
| 18     | 0.8360 | 0.7002 | 0.5874 | 0.4936 | 0.4155 | 0.3503 | 0.2959 | 0.2502 | 0.2120 | 0.1799 | 0.1528 | 0.1300 | 0.1108 | 0.0946 | 0.0808 | 0.0691 | 0.0376 | 0.0208 | 0.0180 | 0.0089 |
| 19     | 0.8277 | 0.6864 | 0.5703 | 0.4746 | 0.3957 | 0.3305 | 0.2765 | 0.2317 | 0.1945 | 0.1635 | 0.1377 | 0.1161 | 0.0981 | 0.0829 | 0.0703 | 0.0596 | 0.0313 | 0.0168 | 0.0144 | 0.0068 |
| 20     | 0.8195 | 0.6730 | 0.5537 | 0.4564 | 0.3769 | 0.3118 | 0.2584 | 0.2145 | 0.1784 | 0.1486 | 0.1240 | 0.1037 | 0.0868 | 0.0728 | 0.0611 | 0.0514 | 0.0261 | 0.0135 | 0.0115 | 0.0053 |
| 21     | 0.8114 | 0.6598 | 0.5375 | 0.4388 | 0.3589 | 0.2942 | 0.2415 | 0.1987 | 0.1637 | 0.1351 | 0.1117 | 0.0926 | 0.0768 | 0.0638 | 0.0531 | 0.0443 | 0.0217 | 0.0109 | 0.0092 | 0.0040 |
| 22     | 0.8034 | 0.6468 | 0.5219 | 0.4220 | 0.3418 | 0.2775 | 0.2257 | 0.1839 | 0.1502 | 0.1228 | 0.1007 | 0.0826 | 0.0680 | 0.0560 | 0.0462 | 0.0382 | 0.0181 | 0.0088 | 0.0074 | 0.0031 |
| 23     | 0.7954 | 0.6342 | 0.5067 | 0.4057 | 0.3256 | 0.2618 | 0.2109 | 0.1703 | 0.1378 | 0.1117 | 0.0907 | 0.0738 | 0.0601 | 0.0491 | 0.0402 | 0.0329 | 0.0151 | 0.0071 | 0.0059 | 0.0024 |
| 24     | 0.7876 | 0.6217 | 0.4919 | 0.3901 | 0.3101 | 0.2470 | 0.1971 | 0.1577 | 0.1264 | 0.1015 | 0.0817 | 0.0669 | 0.0532 | 0.0431 | 0.0349 | 0.0284 | 0.0126 | 0.0057 | 0.0047 | 0.0018 |
| 25     | 0.7798 | 0.6095 | 0.4776 | 0.3751 | 0.2953 | 0.2330 | 0.1842 | 0.1460 | 0.1160 | 0.0923 | 0.0736 | 0.0588 | 0.0471 | 0.0378 | 0.0304 | 0.0245 | 0.0105 | 0.0046 | 0.0038 | 0.0014 |
| 30     | 0.7419 | 0.5521 | 0.4120 | 0.3083 | 0.2314 | 0.1741 | 0.1314 | 0.0994 | 0.0754 | 0.0573 | 0.0437 | 0.0334 | 0.0256 | 0.0196 | 0.0151 | 0.0116 | 0.0042 | 0.0016 | 0.0012 | *      |
| 35     | 0.7059 | 0.5000 | 0.3554 | 0.2534 | 0.1813 | 0.1301 | 0.0937 | 0.0676 | 0.0490 | 0.0356 | 0.0259 | 0.0189 | 0.0139 | 0.0102 | 0.0075 | 0.0055 | 0.0017 | 0.0005 | *      | *      |
| 36     | 0.6989 | 0.4902 | 0.3450 | 0.2437 | 0.1727 | 0.1227 | 0.0875 | 0.0626 | 0.0449 | 0.0323 | 0.0234 | 0.0169 | 0.0123 | 0.0089 | 0.0065 | 0.0048 | 0.0014 | *      | *      | *      |
| 40     | 0.6717 | 0.4529 | 0.3066 | 0.2083 | 0.1420 | 0.0972 | 0.0668 | 0.0460 | 0.0318 | 0.0221 | 0.0154 | 0.0107 | 0.0075 | 0.0053 | 0.0037 | 0.0026 | 0.0007 | *      | *      | *      |
| 50     | 0.6080 | 0.3715 | 0.2281 | 0.1407 | 0.0872 | 0.0543 | 0.0339 | 0.0213 | 0.0134 | 0.0085 | 0.0054 | 0.0035 | 0.0022 | 0.0014 | 0.0009 | 0.0006 | *      | *      | *      | *      |

Table A-4 Present Value Interest Factors for a One-Dollar Annuity Discounted at  $k$  Percent for  $n$  Periods:  $PVIFA = [1 - 1/(1 + k)^n] / k$ 

| Period | 1%     | 2%     | 3%     | 4%     | 5%     | 6%     | 7%     | 8%     | 9%     | 10%    | 11%    | 12%    | 13%    | 14%    | 15%    | 16%    | 20%    | 24%    | 25%    | 30%    |
|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 1      | 0.9901 | 0.9804 | 0.9709 | 0.9615 | 0.9524 | 0.9434 | 0.9346 | 0.9259 | 0.9174 | 0.9091 | 0.9009 | 0.8929 | 0.8850 | 0.8772 | 0.8696 | 0.8621 | 0.8333 | 0.8065 | 0.8000 | 0.7692 |
| 2      | 1.9704 | 1.9416 | 1.9135 | 1.8861 | 1.8594 | 1.8334 | 1.8080 | 1.7833 | 1.7591 | 1.7355 | 1.7125 | 1.6901 | 1.6681 | 1.6467 | 1.6257 | 1.6052 | 1.5278 | 1.4568 | 1.4400 | 1.3609 |
| 3      | 2.9410 | 2.8839 | 2.8286 | 2.7751 | 2.7232 | 2.6730 | 2.6243 | 2.5771 | 2.5313 | 2.4869 | 2.4437 | 2.4018 | 2.3612 | 2.3216 | 2.2832 | 2.2459 | 2.1065 | 1.9813 | 1.9520 | 1.8161 |
| 4      | 3.9020 | 3.8077 | 3.7171 | 3.6299 | 3.5460 | 3.4651 | 3.3872 | 3.3121 | 3.2397 | 3.1699 | 3.1024 | 3.0373 | 2.9745 | 2.9137 | 2.8550 | 2.7982 | 2.5887 | 2.4043 | 2.3616 | 2.1662 |
| 5      | 4.8534 | 4.7135 | 4.5797 | 4.4518 | 4.3295 | 4.2124 | 4.1002 | 3.9927 | 3.8897 | 3.7908 | 3.6959 | 3.6048 | 3.5172 | 3.4331 | 3.3522 | 3.2743 | 2.9906 | 2.7454 | 2.6893 | 2.4356 |
| 6      | 5.7955 | 5.6014 | 5.4172 | 5.2421 | 5.0757 | 4.9173 | 4.7665 | 4.6229 | 4.4859 | 4.3553 | 4.2305 | 4.1114 | 3.9975 | 3.8887 | 3.7845 | 3.6847 | 3.3255 | 3.0205 | 2.9514 | 2.6427 |
| 7      | 6.7282 | 6.4720 | 6.2303 | 6.0021 | 5.7864 | 5.5824 | 5.3893 | 5.2064 | 5.0330 | 4.8684 | 4.7122 | 4.5638 | 4.4226 | 4.2883 | 4.1604 | 4.0386 | 3.6046 | 3.2423 | 3.1611 | 2.8021 |
| 8      | 7.6517 | 7.3255 | 7.0197 | 6.7327 | 6.4632 | 6.2098 | 5.9713 | 5.7466 | 5.5348 | 5.3349 | 5.1461 | 4.9676 | 4.7988 | 4.6389 | 4.4873 | 4.3436 | 3.8372 | 3.4212 | 3.3289 | 2.9247 |
| 9      | 8.5660 | 8.1622 | 7.7861 | 7.4353 | 7.1078 | 6.8017 | 6.5152 | 6.2469 | 5.9952 | 5.7590 | 5.5370 | 5.3282 | 5.1317 | 4.9464 | 4.7716 | 4.6065 | 4.0310 | 3.5655 | 3.4631 | 3.0190 |
| 10     | 9.4713 | 8.9826 | 8.5302 | 8.1109 | 7.7217 | 7.3601 | 7.0236 | 6.7101 | 6.4177 | 6.1446 | 5.8892 | 5.6502 | 5.4262 | 5.2161 | 5.0188 | 4.8332 | 4.1925 | 3.6819 | 3.5705 | 3.0915 |
| 11     | 10.368 | 9.7868 | 9.2526 | 8.7605 | 8.3064 | 7.8869 | 7.4987 | 7.1390 | 6.8052 | 6.4951 | 6.2065 | 5.9377 | 5.6869 | 5.4527 | 5.2337 | 5.0286 | 4.3271 | 3.7757 | 3.6564 | 3.1473 |
| 12     | 11.255 | 10.575 | 9.9540 | 9.3851 | 8.8633 | 8.3838 | 7.9427 | 7.5361 | 7.1607 | 6.8137 | 6.4924 | 6.1944 | 5.9176 | 5.6603 | 5.4206 | 5.1971 | 4.4392 | 3.8514 | 3.7251 | 3.1903 |
| 13     | 12.134 | 11.348 | 10.635 | 9.9856 | 9.3936 | 8.8527 | 8.3577 | 7.9038 | 7.4869 | 7.1034 | 6.7499 | 6.4235 | 6.1218 | 5.8424 | 5.5831 | 5.3423 | 4.5327 | 3.9124 | 3.7801 | 3.2233 |
| 14     | 13.004 | 12.106 | 11.296 | 10.563 | 9.8986 | 9.2950 | 8.7455 | 8.2442 | 7.7862 | 7.3667 | 6.9819 | 6.6282 | 6.3025 | 6.0021 | 5.7245 | 5.4675 | 4.6106 | 3.9616 | 3.8241 | 3.2487 |
| 15     | 13.865 | 12.849 | 11.938 | 11.118 | 10.380 | 9.7122 | 9.1079 | 8.5595 | 8.0607 | 7.6061 | 7.1909 | 6.8109 | 6.4624 | 6.1422 | 5.8474 | 5.5755 | 4.6755 | 4.0013 | 3.8593 | 3.2682 |
| 16     | 14.718 | 13.578 | 12.561 | 11.652 | 10.838 | 10.106 | 9.4466 | 8.8514 | 8.3126 | 7.8237 | 7.3792 | 6.9740 | 6.6039 | 6.2651 | 5.9542 | 5.6685 | 4.7296 | 4.0333 | 3.8874 | 3.2832 |
| 17     | 15.562 | 14.292 | 13.166 | 12.166 | 11.274 | 10.477 | 9.7632 | 9.1216 | 8.5436 | 8.0216 | 7.5488 | 7.1196 | 6.7291 | 6.3729 | 6.0472 | 5.7487 | 4.7746 | 4.0591 | 3.9099 | 3.2948 |
| 18     | 16.398 | 14.992 | 13.754 | 12.659 | 11.690 | 10.828 | 10.059 | 9.3719 | 8.7556 | 8.2014 | 7.7016 | 7.2497 | 6.8399 | 6.4674 | 6.1280 | 5.8178 | 4.8122 | 4.0799 | 3.9279 | 3.3037 |
| 19     | 17.226 | 15.678 | 14.324 | 13.134 | 12.085 | 11.158 | 10.336 | 9.6036 | 8.9501 | 8.3649 | 7.8393 | 7.3658 | 6.9380 | 6.5504 | 6.1982 | 5.8775 | 4.8435 | 4.0967 | 3.9424 | 3.3105 |
| 20     | 18.046 | 16.351 | 14.877 | 13.590 | 12.462 | 11.470 | 10.594 | 9.8181 | 9.1285 | 8.5136 | 7.9633 | 7.4694 | 7.0248 | 6.6231 | 6.2593 | 5.9288 | 4.8696 | 4.1103 | 3.9539 | 3.3158 |
| 21     | 18.857 | 17.011 | 15.415 | 14.029 | 12.821 | 11.764 | 10.836 | 10.017 | 9.2922 | 8.6487 | 8.0751 | 7.5620 | 7.1016 | 6.6870 | 6.3125 | 5.9731 | 4.8913 | 4.1212 | 3.9631 | 3.3    |